

**Practice: 574 - Spring Development****Scenario: #1 - Spring Development - Concrete Cutoff****Scenario Description:**

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a 50 ft long, 1.5 inch SCH40 PVC hand perforated pipe enclosed in a sand/gravel envelope overlaid by 2 ft wide filter fabric (50 ft long) and behind a concrete cutoff wall (6 inch x 4 ft height x 25 ft long) to retain water. Water is directed (via 20 ft long, 1.5 inch PVC) to a spring box (48 inch diameter x 6 ft long CMP) that is located at the cutoff wall or below the wall, equipped with a watertight lid and two outlets. One outlet serves as overflow pipe to account for occasions where inflow exceeds outflow. The collection system is commonly composed of a single or a network of perforated 4 inch diameter drainage pipe placed in an excavated collection trench that runs across the slope. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use.

Resource Concern: Livestock production limitation - Inadequate livestock water.

Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

**Before Situation:**

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:**

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

**Scenario Feature Measure: Number of Developments**

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$3,552.26

**Scenario Cost/Unit:** \$3,552.26

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$51.29	16	\$820.64
Concrete, CIP, formed reinforced	38	Steel reinforced concrete formed and cast-in-place in formed structures such as walls or suspended slabs by chute placement. Typical strength is 3000 to 4000 psi. Includes materials, labor and equipment to transport, place and finish.	Cubic yard	\$333.03	2	\$666.06
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.14	11	\$23.54
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$20.63	32	\$660.16
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$21.25	16	\$340.00
<b>Materials</b>						
Aggregate, Sand, Graded, Washed	45	Sand, typical ASTM C33 gradation, includes materials, equipment and labor to transport and place	Cubic yard	\$34.40	2	\$68.80
Pipe, CMP, 48", 14 Gauge	1280	48" Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only.	Foot	\$30.32	6	\$181.92
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$34.86	2	\$69.72
Spring Collection Box Cover, steel, 4' diameter	1281	4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	\$178.80	1	\$178.80
Pipe, PVC, 1 1/2", SCH 40	975	Materials: - 1 1/2" - PVC - SCH 40 - ASTM D1785	Foot	\$1.06	70	\$74.20

**Mobilization**

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Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$234.21	2	\$468.42
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**Practice: 574 - Spring Development****Scenario: #2 - Spring Development - Clay Cutoff****Scenario Description:**

Develop a water source from a natural spring or seep (i.e., spring development) to provide water for livestock and/or wildlife needs. This typical scenario includes excavating and exposing the water source at the spring/seep (typically on a hillside), constructing a water collection structure by installing a Spring Box (fabricated from a 48 inch diameter x 4ft long CMP) that is located upstream from a 25 ft long arced compacted clay cut-off berm located to retain water. The excavation is 25 ft x 8 ft with average depth of 3 ft. Gravel or sand drainfill is used to backfill in the excavation and around the spring box. The drainfill is protected along the sides and top from soil intrusion with filter fabric. A 6 inch layer of topsoil is placed on top of the filter fabric. The spring box is perforated along the sides and upstream side, equipped with a watertight lid and is plumbed such that sand or other debris will collect in the bottom. The outflow pipe from the spring box can be directed to buried large storage (not included), and to a watering facility (not included) for use. An overflow pipe may be installed for occasions where inflow exceeds outflow.

Resource Concern: Livestock production limitation - Inadequate livestock water.

Associated Practices: 516-Livestock Pipeline; 614-Watering Facility; 382-Fence; Critical Area Planting (342).

**Before Situation:**

Livestock operation with inadequate fresh water for livestock and an on-site undeveloped spring/seep.

**After Situation:**

Spring development system provides adequate water for the intended use. The system typically runs all year long in most zones.

**Scenario Feature Measure: Number of Developments**

**Scenario Unit:** Each

**Scenario Typical Size:** 1

**Scenario Cost:** \$2,258.85

**Scenario Cost/Unit:** \$2,258.85

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Geotextile, woven	42	Woven Geotextile Fabric. Includes materials, equipment and labor	Square Yard	\$2.14	20	\$42.80
Backhoe, 80 HP	926	Wheel mounted backhoe excavator with horsepower range of 60 to 90. Equipment and power unit costs. Labor not included.	Hour	\$51.29	11	\$564.19
<b>Labor</b>						
Equipment Operators, Light	232	Includes: Skid Steer Loaders, Hydraulic Excavators <50 HP, Trenchers <12", Ag Equipment <150 HP, Pickup Trucks, Forklifts, Mulchers	Hour	\$21.25	10	\$212.50
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$20.63	20	\$412.60
<b>Materials</b>						
Spring Collection Box Cover, steel, 4' diameter	1281	4' diameter x 1/4" thick Steel lid with handle for spring collection box. Materials and fabrication.	Each	\$178.80	1	\$178.80
Pipe, CMP, 48", 14 Gauge	1280	48" Corrugated Metal Pipe, Galvanized, Uncoated, 14 gage. Material cost only.	Foot	\$30.32	6	\$181.92
Pipe, PVC, 1 1/2", SCH 40	975	Materials: - 1 1/2" - PVC - SCH 40 - ASTM D1785	Foot	\$1.06	22	\$23.32
Aggregate, Gravel, Graded	46	Gravel, includes materials, equipment and labor to transport and place. Includes washed and unwashed gravel.	Cubic yard	\$34.86	5	\$174.30
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$234.21	2	\$468.42